

**IN THE CLAIMS:**

20. (*currently amended*) A method executed by a radiation source detection system for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radioactive radiation counts [[for]] that occur during each of at least two substantially distinct time slices occurring during the approximate time period the source passes the apparatus; and

Calculating a correlation [[of]] among at least two of the measured radiation counts with respect to either all of the at least two time slices or a subset of the at least two time slices corresponding to the at least two measured counts

Calculating the probability that the measured counts received in each of the at least two time slices is attributable to background radioactive radiation;

Determining the degree that the set of calculated probabilities correlate with a radioactive radiation source passing the detector during the approximate time period;

Storing the result of the determination step.

25. (*currently amended*) A method executed by a radioactive radiation source detection system for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radioactive radiation counts [[for]] that occur during each of a plurality of substantially distinct time slices occurring during the approximate time period that the radioactive source passes the apparatus;

Calculating for each time slice within a subset of the plurality of time slices the probability that the radioactive radiation counts for the time slice came from background where the subset has at least two elements; and

Determining the degree that the set of calculated probabilities correlate with a radioactive radiation source passing the detector during the approximate time period;

Storing the result of the determination step.

32. (*currently amended*) A method executed by a radioactive radiation source detection system for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radiation counts detected by at least two detectors comprising the apparatus; and

~~Calculating a correlation [[of]] among the at least two of the measured radiation counts with respect to either all of the at least two the detectors or a subset of the at least two detectors corresponding to the at least two measured radiation counts.~~

Determining the degree that the set of measured radioactive radiation counts correlate with a radioactive radiation source passing the detectors during the approximate time period;

Storing the result of the determination step.

37. *(currently amended)* A method executed by a radioactive radiation source detection system for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radiation counts detected by a plurality of detectors comprising the apparatus; and

~~Calculating for each detector within a subset of the plurality of detectors the probability that the radiation counts for that detector came from background;~~

Calculating the probability that the measured counts received in each of the plurality of detectors is attributable to background radioactive radiation;

Determining the degree that the set of calculated probabilities correlate with a radioactive radiation source passing the detector during the approximate time period;

Storing the result of the determination step.

46. *(currently amended)* A method executed by a radioactive radiation source detection system for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring in each of [[the]] at least two detectors comprising the apparatus the individual approximate number of radioactive radiation counts during each of at least two substantially distinct time slices occurring approximately during the time period the source passes the apparatus; and

~~Calculating a first correlation [[of]] among [[the]] at least two measured radiation counts with respect to their corresponding a subset of the at least two time slices together with and a second correlation among the at least two measured radiation counts with respect to their corresponding subset of the at least two detectors.~~

Determining the degree that the set of measured radioactive radiation counts correlate with a radioactive radiation source passing the detectors during the approximate time period;

Storing the result of the determination step.

49. (*currently amended*) The method of Claim 27 A method for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radioactive radiation counts for each of a plurality of substantially distinct time slices occurring during the approximate time period that the radioactive source passes the apparatus;

where there is no calculating of probabilities step; and [[the]] determining [[step is]] whether at least two of for some integer n, n of the radiation counts corresponding to the plurality of time slices the subset are greater than or equal to a pre-determined threshold, where the number n is greater than or equal to two and less than or equal to the number of time slices;

Storing the result of the determination step.

51. (*currently amended*) The method of Claim 39 where there is no calculating of probabilities step;

A method for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radioactive radiation counts detected by a plurality of detectors comprising the apparatus during the approximate period of time the source passes the apparatus;

and [[the]] determining [[step is]] whether at least two for some integer n, n of the radioactive radiation counts corresponding to the [[subset]] plurality of detectors are greater than or equal to a pre-determined threshold, where the number n is greater than or equal to two and less than or equal to the number of the plurality of detectors;

Either or both storing the result of the determination step or initiating an alarm if the determination result meets a pre-determined criteria.

71. (*new*) A method executed by a radiation source detection system for detecting low-level radioactive sources moving past a detection apparatus comprising:

Measuring the approximate number of radioactive radiation counts that occur during each of a plurality of substantially distinct time slices occurring during the approximate time period that the radioactive source passes the apparatus;

Calculating for each time slice within a subset of the plurality of time slices the probability that the radiation counts for the time slice came from a radiation source where the subset has at least two elements;

Determining the degree that the set of calculated probabilities correlate with a radioactive radiation source passing the detector during the approximate time period;

Storing the result of the determination step.

Respectfully Submitted,

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